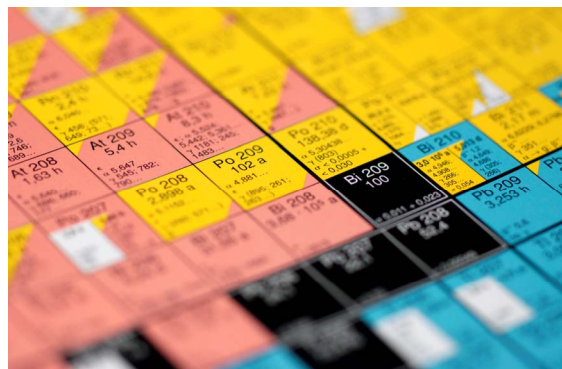




Karlsruher Nuklidkarte Commemoration of the 50th Anniversary

What is the Karlsruher Nuklidkarte?

- The “Karlsruher Nuklidkarte” is a type of extended periodic table of the elements, which displays all known atoms of any element and their radioactive data.
- It provides scientists and students all over the world with structured, accurate information on the half-lives and decay modes of radionuclides, as well as the energies of emitted radiation.
- The first edition of the “Karlsruher Nuklidkarte” was published in 1958 and contained information on approximately 1300 nuclides grouped in 102 chemical elements.
- Since then, more than 1650 new nuclides have been discovered and the elements 103 to 116 and 118 have been identified.
- In addition, new decay modes have been detected including double beta decay, proton decay, beta delayed particle emission, cluster emission, bound beta decay from highly ionised atoms, and more recently two proton decay.
- Starting with the 7th edition, the Institute for Transuranium Elements of the European Commission's Joint Research Centre has taken over the management of the Chart by providing support and development of the current and future editions.
- The current 7th edition contains information on approximately 3000 nuclides. According to theoretical predictions, at least 6000 “bound” nuclides are believed to exist between the proton and neutron drip-lines.



What are nuclides and why do we chart them?

- In science, the term *nuclide* is used to categorise an atom (stable or unstable) characterized by the number of protons and the number of neutrons in its nucleus. All isotopes of an element contain the same number of protons but different numbers of neutrons in the nucleus.
- Nuclide charts hence offer a full description of the radioactive attributes of an element and its isotopes, providing a unique overview of current knowledge in nuclear science.

Broad Range of Applications

- Beyond the more traditional physical sciences such as health physics and radiation protection, nuclear and radiochemistry, and astrophysics, the Chart is now in wide and common usage in the life and earth sciences (biology, medicine, agriculture, geology, etc.).
- Due to the Chart's great didactic value in education and training in nuclear sciences, it has been used in training programmes worldwide and is a valuable and welcome addition to many books on nuclear science including school physics textbooks.

